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Prepared by

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Background:

The rationale for this research lies in the hypothesis that commonly used measures of human tracking performance are differentially sensitive to a variety of psychological variables. Since many of these variables are difficult or impossible to control experimentally, the results of this research should have important methodological implications for future experimental studies.

To investigate this problem area, an experimental situation is being established to: (1) manipulate the motivational level of subjects while they are performing a compensatory tracking task; and (2) systematically compare the resultant changes in seven simultaneously obtained performance measures.

The major apparatus items consist of an F86L Flight Simulator, an Ampex FM tape recorder, and a general purpose analog computer. The compensatory tracking problem is presented on the E-4 Fire Control System scope located in the simulator cockpit. In order to vary the complexity of the task and to provide more easily generalized data, three different control dynamics will be used, viz. $\frac{K}{S}$; $\frac{K}{TS+1}$; $\frac{K}{S(TS+1)}$.

All data will be directly recorded on an FM tape recorder for later analysis. The data recorded will be: forcing function, subject response, i. e, control stick movement. These data will permit us to recreate the subject's performance for the performance measurement analysis and also for use in the transfer function model matching.

Work to be accomplished during this period.

The pilot study, started during the previous quarter, was completed, permitting certain critical judgments to be made regarding details of the experimental design.

Further work has been accomplished with respect to the experimental design. For the most part, changes in the design have been in the direction of improving the data analysis procedures. Copies of the design can be made available upon request.

Changes in the data collection procedure in the direction of simplifying these procedures were made possible due to the acquisition, during this period, of an Ampex FM tape recorder. This recorder will add immensely to the flexibility associated with the transfer function model matching portion of this work.

50 students have been selected from the student body of The Catholic University of America, to serve as subjects in this first experiment. (These 50 students were selected according to criteria established in the experimental design.)

During this period, special attention was given to smoothing and linearizing control stick forces. This effort has resulted in minimizing the shifting of control loadings and the removal of all apparent discontinuities.

Work to be accomplished during the next quarter:

Data collection is scheduled to commence 22 April 1963. It is anticipated that all data runs will be completed by 10 May 1963. Target dates for completion of the analysis and report on the performance measures portion of this study should be finished by 31 May 1963, with the report on transfer functions following about the end of August, 1963.

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